FIRST TIME TITLE V AIR PERMIT APPLICATION REVIEW

Revised 7/12/99

APPLICANT:	SITE LOCATION:		COUNTY:
United States Gypsum Company	Spruce Pine		Mitchell
TECHNICAL CONTACT:	**PHONE:**	**RESPONSIBLE OFFICIAL:**	**TITLE:**
Lanita Stevens	312-606-4352	Randy Ruddell	Plant Manager
REVIEW ENGINEER:	**SIGNATURE:**		**DATE:**
Kevin Godwin			XX
REGIONAL CONTACT:	**REGIONAL OFFICE:**		**SIC CODE:**
Patrick Ballard	Asheville Regional Office		3295
APPLICATION NUMBER:	**EXISTING PERMIT NUMBER:**		**NEW PERMIT NUMBER:**
6100016.02A	04314R06		**04314T07**

I. Introduction

The U.S. Environmental Protection Agency (EPA) has given final approval to North Carolina's Title V operating permits program effective on October 1, 2001. This EPA approval triggered the requirements for Title V facilities to submit permit applications to the Division of Air Quality. Title V facilities are required to obtain an operating permit which addresses all applicable regulations under the State Implementation Plan, Federal Implementation Plan, and other provisions of the Clean Air Act (CAA). The Title V Operating Permit will define all of the facility's obligations under the CAA.

This first time Title V Air Permit application review intends to convey all pertinent emissions data, rules, policies, and engineering assumptions used to construct the Title V operating permit. The primary source of information used to construct the permit is the above referenced air permit application.

II. Background Information

The first time Title V operating permit replaces an existing Air Quality Construction and Operation Permit No.04314R06 which was issued on January 6, 2003 and is currently scheduled to expire on December 31, 2007.

Pursuant to 15A NCAC 2Q .0506, United States Gypsum Company submitted its first time Title V application to the Division of Air Quality on June 28, 2002. The application was considered complete for processing on July 18, 2002. The DRAFT permit is required to go to public notice pursuant to 15A NCAC 2Q .0521.

III. Facility Description

This facility is the former Diamond Mica plant purchased in 1981. In 1982 all new equipment was installed. The trigger date for NSPS Subpart OOO is August 31, 1983. Thus, the sources at this facility are currently not subject to this standard. However, future modifications may trigger Subpart OOO.

The facility dries and grinds mica for use in sheet rock joint compound. Raw mica is purchased from the adjacent Feldspar Corporation facility and other local sources at approximately 25% moisture.

Purchased mica is delivered on site by dump truck and placed in the mica storage pit/truck dump. Water sprays on the storage pile are used to keep the material wet to prevent fugitive dust emissions. Haul roads are also watered to suppress dust.

Using loaders, the wet mica is put into the mica dryer feed hopper. The hopper feeds mica into the natural gas direct -fired rotary dryer. PM emissions from the mica dryer are controlled by a bagfilter.

The dried mica (now 8% moisture) is either stored in three dry storage bins or fed thru the dry feed distribution system into the three jet grinding mills. Heated air from a No. 2 fuel oil-fired indirect pre-heater is introduced into the grinding mills, resulting in a final product moisture content of 0%. The ground mica is then screened. Screen rejects are returned to the dry feed distribution system by the oversize screw conveyor.

The screened mica is then sent via the finished product elevator to four (4) bulk loading bins for loading into railcars or the two baggers. Particulate emissions from the grinding mills, oversize screw conveyor, finished product elevator, bulk loading and bagging operations, and a house-keeping vacuum system are controlled by three (3) bagfilters in parallel. There is also a separate bulk railcar loading station, equipped with a separate bagfilter.

The raw mica has had No. 2 fuel oil added as a flotation agent during mining. Volatilization of this oil residue during drying and processing of the mica results in volatile organic compound emissions sufficient to require a PSD avoidance limit of less than 39,000 tons of dried mica produced per consecutive 12 month period. Strong diesel fuel oil odors are evident on the plant site, but not off-site.

IV. Statement of Compliance

The DAQ has reviewed the compliance status of this facility. On its latest inspection on June 22, 2004, the facility was in compliance with all applicable requirements. The applicant has certified that the facility will be in compliance with all applicable requirements. The applicant has also certified that the facility will be in compliance with any applicable requirements taking effect during the term of the permit and will meet such requirements on a timely basis.

V. Summary of Emission Sources and Control Devices

The following table identifies all emission sources and associated control devices for which the Initial Title V Operating Permit is being issued.

Emission Source ID No.	Emission Source Description	Control Device ID No.	Control Device Description
ES-1	No. 2 fuel oil-fired rotary mica dryer (7.5 tons per hour maximum production rate, 6.05 million Btu per hour maximum heat input rate)	CD-1	pulse jet bagfilter (3,825 square feet of filter area)
ES-2, ES-3, and ES-4	three (3) jet grinding mills (2.5 tons per hour maximum production rate each) including:	CD-2, CD-3, and CD-4	three (3) jet pulse bagfilters (1,600 square feet of filter area, each) in parallel.
ES-6, ES-7, ES-8, and ES-9	four (4) bulk loading storage bins (5 tons per hour maximum loading rate each)		
ES-10	oversize conveyor (1.25 tons per hour maximum process rate)		

ES-11	finished product elevator (5 tons per hour maximum process rate)		
ES-12	vacuum system with internal bagfilter (80 square feet of filter area) for housecleaning purposes (2 tons per hour maximum process rate)		
ES-13	St. Regis bagger and feed bin (5 tons per hour maximum process rate)		
ES-14	Durant bagger and feed bin (5 tons per hour maximum process rate)		
ES-15	Mica storage pit/ truck dump	NA	NA
ES-16	Mica dryer feed hopper	NA	NA
ES-17	Railcar loading station (5 tons per hour maximum	CD-5	jet pulse bagfilter (80 square feet of filter area)

VI. Emission Source-by-Source Evaluation

A. No. 2 fuel oil-fired rotary mica dryer (ID No. 1) equipped with a pulse jet bagfilter (ID No. CD-1)

1. Process Description

Raw mica is heated in the rotary dryer to remove excess moisture. This source is subject to the requirements of 15A NCAC 2D .0509 "Particulates from Mica or Feldspar Processing Plants."

2. Applicable Regulatory Requirements

The following provides a summary of limits and/or standards for the emission source(s) described above. A review of the information in the application was performed to ensure the appropriate limits and associated calculations used to show compliance were correct.

Regulated Pollutant	**Limits/Standards**	**Applicable Regulation**
Particulate matter including PM_{10}	$E = 4*P^{0.0677}$ where: E= Allowable emission rate (lb/hr) and P= Process rate (tons/hr) when $P \leq 30$ tons/hr	15A NCAC2D .0509
Sulfur dioxide	2.3 lb/million Btu maximum heat input rate	15A NCAC 2D .0516
Visible emissions	Not more than 20 per cent opacity when averaged over a six minute period, except that six minute periods averaging not more than 87 per cent opacity may occur not more than once an hour nor more than four times in any 24-hour period.	15A NCAC 2D .0521

Fugitive non-process particulate emissions	Fugitive non-process dust emissions must be controlled (See Section VII.)	15A NCAC 2D .0540
Volatile organic compounds	To avoid applicability of 15A NCAC 2D.0530 "Prevention of Significant Deterioration", facility-wide VOC emissions shall be less than 250 tons per consecutive 12 month period.	15A NCAC 2Q .0317
Odorous emissions	**State enforceable only** Odorous emissionsmust be controlled (See Section VII.)	15A NCAC 2D .1806

a. **15A NCAC 2D .0509 "Particulates from Mica or Feldspar Processing Plants"**

i. Regulatory Analysis

Emissions of particulate matter from the rotary mica dryer shall not exceed an allowable emission rate as calculated by the following equation:

$E = 4.0 * P^{0.677}$

where, E = allowable emission rate (lb/hr)
P = process weight rate (tph) for processes less than 30 tph

The maximum production rate for this mica dryer is 7.5 tons per hour which yields an allowable emission rate of 15.64 pounds per hour. Based on conservative operating experience and test results at other installations, the applicant reports the particulate matter concentration exiting the bagfilter as 0.02 grains/ft^3. The regional engineer agrees that this appears to be a resonable estimate. The bagfilter experiences a flow rate of 15,000 cfm and is expected to provide a 99.9% control efficiency (ref. bagfilter spreadsheet). After control emissions are 2.66 pounds per hour. Compliance with this regulation is indicated.

ii. Testing Requirements

If emissions testing is required, the testing shall be performed in accordance with General Condition JJ. If results of this test are above the limit given above, the Permittee shall be deemed in noncompliance with 15A NCAC 2D .0509.

iii. Monitoring Requirements

Particulate matter emissions from the mica dryer shall be controlled by a bagfilter. To assure compliance, the Permittee shall perform inspection and maintenance as recommended by the manufacturer. As a minimum, the inspection and maintenance program shall include: a monthly visual inspection of the system ductwork and material collection unit for leaks; and an annual internal inspection of the bagfilter's structural integrity.

Results of inspection and maintenance shall be recorded in a log kept on-site and made available to DAQ personnel upon request.

iv. Reporting Requirements

The Permittee shall submit the results of any maintenance performed on the bagfilter within 30 days of written request by the DAQ. The Permittee shall submit a summary report of monitoring and recordkeeping activities every six months.

b. **15A NCAC 2D .0516 "Sulfur Dioxide Emissions from Combustion Sources"**

i. Regulatory Analysis

Emissions of sulfur dioxide from combustion sources shall not exceed 2.3 pounds per million Btu heat input. Due to the inherently low sulfur content of No. 2 fuel oil, this limit will not be exceeded.

ii. Monitoring/Recordkeeping Requirements

No monitoring or recordkeeping is required for sulfur dioxide emissions from firing of No. 2 fuel oil in the dryer.

c. **15A NCAC 2D .0521 "Control of Visible Emissions"**

i. Regulatory Analysis

As this mica dryer was manufactured after July 1, 1971, it is subject to .0521(d). Visible emissions shall be no more than 20 percent opacity when averaged over a six-minute period. As noted in the latest inspection report, visible emissions coming from the bagfilter are in complinace with the 20 percent limit. However, elevated smoke emissions not coming from the bagfilter were observed, but not long enough to document a violation. The inspector voiced his concerns to the operator. The operator indicated that ductwork associated with the elevated visible emissions were due to be replaced the following day.

ii. Testing Requirements

If emissions testing is required, the testing shall be performed in accordance with General Condition JJ.

iii. Monitoring/Recordkeeping Requirements

Once a day, the Permittee shall observe the emission points of the mica dryer for any visible emissions above normal. The daily observaion must be made for each day of the calendar year period to ensure compliance with this requirement.

The results of monitoring shall be maintained in a log which shall be kept on-site and made available to DAQ personnel upon request.

iii. Reporting Requirements

The Permittee shall submit a summary report of the observations every six months.

B. Mica processing equipment including: three jet grinding mills (ID Nos. ES-2, ES-3, and ES-4); four bulk loading storage bins (ID Nos. ES-6, ES-7, ES-8, and ES-9); one oversize screw conveyor (ID No. ES-10); finished product elevator (ID No. ES-11); vacuum system with internal bagfilter (ID No. ES-12); St. Regis bagger and feed bin (ID No. ES-13); and Durant bagger and feed bin (ID No. ES-14) equipped with three bagfilters (ID Nos. CD-2, CD-3, and CD-4)

1. Process Descripton

After processing in the rotary dryer, mica is conveyed into the mills. Using compressed air heated by a 1.8 mmBtu per hour preheater, the mica flakes collide together to produce a powder. The mica is then sent through a screening process. Material which passes the screens is sent for packaging. Remaining material is sent back to the starting point of the mill to be re-processed. Due to electricity constraints, only two mills can operate at a time. A physical change at the facility would have to occur to allow for additional electrical input to operate all three mills. These sources are subject to 15A NCAC 2D .0509 "Particulates from Mica or Feldspar Processing Plants."

The vacuum system is used for housekeeping purposes.

2. Applicable Regulatory Requirements

Regulated Pollutant	**Limits/Standards**	**Applicable Regulation**
Particulate matter including PM_{10}	$E = 4*P^{0.677}$ where, E = Allowable emission rate (lb/hr) P = Process weight rate (tph) for rates less than 30 tph	15A NCAC 2D .0509
Visible emissions	20 percent opacity	15A NCAC 2D .0521(d)
Fugutive non-process particulate emissions	Fugitive non-process dust emissions must be controlled (See Section VII.)	15A NCAC 2D .0540
Volatile organic compounds	less than 250 tpy facility-wide (See Section VII.)	15A NCAC 2Q .0317
Odorous emissions	**State-enforceable only** odorous emissions must be controlled (see Section VII.)	15A NCAC 2D .1806

a. **15A NCAC 2D .0509 "Particulates from Mica or Feldspar Processing Plants"**

i. Regulatory Analysis

Particulate matter emissions from the mica production equipment shall not exceed an allowable emission rate as calculated by the following equation:

$$E = 4 * P^{0.677}$$

Where, E = allowable emission rate (lb/hr)
P = process weight rate (tph)

The maximum process rate for these sources is limited by available electricity to 5.0 tons per hour total. The allowable emission rate is calculated to be 11.9 pounds per hour. After control emissions are calculated assuming a particulate exit loading of 0.02 grains/ft^3 to be 1.71 pounds per hour. The bagfilters experience an air flow rate of 3,300 cfm and are expected to provide a 99.9% control efficiency (ref. Bagfilter spreadsheet). Compliance with this regulation is indicated.

ii. Testing Requirements

If emissions testing is required, the testing shall be performed in accordance with General Condition JJ. If the results of this test are above the limit given above, the Permittee shall be deemed in noncompliance with 15A NCAC 2D .0509.

ii. Monitoring/Recordkeeping

Particulate matter emissions from the mica production equipment shall be controlled by bagfilters. To assure compliance, the Permittee shall perform inspections and maintenance as recommended by the manufacturer. As a minimum, the inspection and maintenance program shall include: a monthly visual inspection of the system ductwork and material collection unit for leaks, and an annual internal inspection of the bagfilters' structural integrity.

Results of the inspection and maintenance shall be maintained in a log which shall be kept on-site and made available to DAQ personnel upon request.

iii. Reporting

The Permittee shall submit the results of any maintenance performed on the bagfilters within 30 days of writted request by DAQ. The Permittee shall submit a summary report of monitoring and recordkeeping every six months.

b. **15A NCAC 2D .0521 "Control of Visible Emissions"**

i. Regulatory Analysis

Visible emissions from the mica production equipment shall not exceed 20 percent opacity when averaged over a six minute period. Based on the latest inspection report, no visible emissions were observed from the bagfilter exhausts. Compliance with this regulation is indicated.

ii. Testing Requirement

If emissions testing is required, the testing shall be performed in accordance with 15A NCAC 2D .0501(c)(4) and General Condition JJ.

iii. Monitoring/Recordkeeping

To assure compliance, once a week the Permittee shall observe the emission points of the mica production equipment for visible emissions above normal.

The results of monitoring shall be maintained in a log which shall be kept on-site and made available to DAQ personnel upon request.

iv. Reporting

The Permittee shall submit a summary report of the observations every six months.

C. Mica storage pit/truck dump(ID Nos. ES-15), Mica dryer feed hopper (ID No. ES-16), and railcar loading station (ID No. ES-17) and associated bagfilter (ID No. CD-5)

1. Process Description

The storage pit/truck dump and the mica dryer feed hopper are fugitive particulate matter emission sources, while the railcar loading station is controlled by a bagfilter. These sources are subject to 15A NCAC 2D .0509 "Particulates from Mica or Feldspar Processing Plants."

2. Applicable Regulatory Requirements

Regulated Pollutant	Limits/Standards	Applicable Regulation
Particulate matter including PM_{10}	$E = 4 * P^{0.677}$ where, E = allowable emission rate (lb/hr) P = process weight rate (tph)	15A NCAC 2D .0509
Visible emissions	20 percent opacity	15A NCAC 2D .0521(d)
Fugitive non-process particulate emissions	Fugitive non-process dust emissions must be controlled (See Section VII.)	15A NCAC 2D .0540
Volatile organic compounds	less than 250 tpy facility-wide	15A NCAC 2Q .0317
Odorous emissions	**State-enforceable only** odorous emissions must be controlled	15A NCAC 2D .1806

a. **15A NCAC 2D .0509 "Particulates from Mica or Feldspar Processing Plants"**

i. Regulatory Analysis

Particulate matter emissions from the mica storage pit/truck dump, mica feed dryer, and railcar loading station must not exceed an allowable emission rate as calculated by the following equation:

$$E = 4 * P^{0.677}$$

where, E = allowable emission rate (lb/hr)
P = process weight rate (tph)

The process input rate to the railcar loading station is reported as 5.0 tons per hour. Allowable emissions are calculated to be 11.9 pounds per hour. After control emissions are calculated assuming a particulate exit loading of 0.02 grains/ft^3 to be 0.042 pounds per hour. The bagfilter experiences an air flow rate of 80 cfm and is expected to provide a 99.9% control efficiency.

As stated in 15A NCAC 2D .0509, fugutive non-process dust emissions shall be controlled by the 2D .0540. There have been no fugitive dust complaints from citizens regarding this facility. The historical complaints have been primarily due to bagfilter problems and not from "non-process" sources. Compliance with this regulation is indicated.

ii. Testing Requirements

If emissions testing is required, the testing shall be performed in accordance with General Condition JJ.

iii. Monitoring/Recordkeeping Requirements

The Permittee shall maintain production records which specify the types of materials processed and shall make these records available to DAQ personnel upon request.

The railcar loading station shall be controlled by a bagfilter. To assure compliance, the Permittee shall perform inspection and maintenance as recommended by the manufacturer. As a minimum, the inspection and maintenance requirement shall include: a monthly visual inspection of the system ductwork and material collection unit for leaks; and an annual internal inspection of the bagfilter's structural integrity.

The results of inspection and maintenance shall be maintained in a log which shall be kept on-site and made available to DAQ personnel upon request.

iv. Reporting Requirements

The Permittee shall submit the results of any maintenance performed on the bagfilter within 30 days of written request by DAQ. The Permittee shall submit a summary report of monitoring and recordkeeping activities every six months.

b. **15A NCAC 2D .0521 "Control of Visible Emissions"**

i. Regulatory Analysis

Visible emissions from these sources shall not exceed 20 percent opacity when averaged over a six-minute period. At present, the raw material as delivered to the stock piles is relatively moist. Also, according to recent inspection report, the facility does water the dirt haul roads regularly. This practice will minimize off-site visible dust. The bagfilter on the railcar loading station is expcected to adequately control visible dust. Compliance with this regulation is indicated.

ii. Testing Requirements

If emissions testing is required, the testing shall be performed in accordance with General Condition JJ.

iii. Monitoring/Recordkeeping Requirements

To assure compliance, once a month, the Permittee shall observe the emission points for any visible emissions above normal. The results of this monitoring shall be maintained in a log on-site and made available to DAQ personnel upon request.

iv. Reporting Requirements

The Permittee shall submit a summary report of the observations every six months.

VII. Multiple Emission Source Limits

A. Facility-wide Soures

The above emission sources are subject to these limits and/or standards:

Regulated Pollutant	Limits/Standards	Applicable Regulation
Volatile organic compounds	less than 250 tpy facility-wide	15A NCAC 2Q .0317
Fugutive particulate matter emissions	Fugutive non-process dust emissions must be controlled	15A NCAC 2D .0540
Odorous emissions	**State-enforceable only** odorous emissions must be controlled	15A NCAC 2D .1806

1. **15A NCAC 2Q .0317: Avoidance Condition for 15A NCAC 2D .0530 "Prevention of Significant Deterioration"**

   a. In order to avoid applicability of 15A NCAC 2D .0530(g) for major sources and major modifications, the entire facility shall discharge into the atmosphere less than 250 tons of volatile organic compounds (VOCs) total consecutive 12-month period.

   b. Monitoring/Recordkeeping Requirements

      To assure compliance with the limit, facility-wide mica production shall not exceed 39,000 tons per consecutive 12-month period (dry finished product).

      Calculations shall be made at the end of each month. VOC emissions shall be determined by multiplying the total amount of mica produced by the most current and accurate diesel fuel VOC emission factor. Calculations, the total amount of mica produced, and the total VOC emissions shall be recorded in a log kept on-site and made available to DAQ personnel upon request.

      By January 1, 2007, the Permittee shall submit a raw material and finished product sampling protocol to verify the diesel fuel/VOC emission factor. The sampling shall take place in the calendar year 2007 and shall be completed by August 30, 2007.

   c. Reporting Requirements

      The Permittee shall submit a summary report of monitoring and recordkeeping activities every six months.

2. **15A NCAC 2D .0540 "Fugitive Non-process Particulate Emissions"**

   a. The owner or operator of a facility required to comply with 15A NCAC 2D .0509, shall not cause or allow fugitive non-process dust emissions to cause or contribute to substantive complaints.

3. **15A NCAC 2D .1806 "Control and Prohibition of Odorous Emissions"**

   a. The Permittee shall not operate the facility without implementing management practices or installing and operating odor control equipment sufficient to prevent odorous emissions from the facility.

VIII. MACT Applicability and Requirements

Based on a review of the facility's current operations and emission sources, the facility is not subject to an promulgated or proposed MACT standards.

IX. Permit Shield (including non-applicable requirements)

In accordance with 2Q .0512 the permit will contain a provision stating that compliance with the terms, conditions, and limitations of the Title V permit shall be deemed in compliance with applicable requirements specifically identified in the permit, as of the date of permit issuance. If the permit does not expressly state that a permit shield exists then it shall be presumed not to provide such a shield.

X. General Conditions

The "General Conditions" section of the Title V Operating Permits lists additional applicable rule requirements that the permittee must adhere to, as with any other permit condition. These requirements in general are common to all Title V facilities. The general conditions include provisions such as annual fee payment, permit renewal and expiration, transfer of ownership or operation, property rights, submission of documents, inspections and entry procedures, reopen for cause, and severability.

XI. Insignificant Activities

The insignificant activities listed in the application have been reviewed and verified. Because an emission source or activity is insignificant does not mean that the emission source or activity is exempted from any applicable requirement or that the owner or operator of the source is exempted from demonstrating compliance with any applicable requirement.

XII. Public Notice

Pursuant to 15A NCAC 2Q .0521, a notice of the draft Title V Operating Permit shall be placed in a newspaper of general circulation in the area where the facility is located. The notice will provide for a 30 day comment period, with an opportunity for a public hearing. Copies of the public notice shall be sent to persons on the Title V mailing list, the following affected states Tenessee, South Carolina, and EPA.

XIII. Recommendations

The first time Title V application for United States Gypsum Company has been reviewed by the DAQ to determine compliance with all procedures and requirements under 15A NCAC 2Q .0500 and 40 CFR Part 70. The DAQ has made a preliminary determination that the facility is complying or will achieve compliance as specified in the permit with all applicable requirements. Therefore, the DAQ is proposing to issue the Title V Operating Permit upon completion of the public comment period and the EPA review.